

**Notes October 15, 2007**  
**Nutrient Science Advisors Group**  
**257 Science Hall**

Participants: Tom Wilton, Joe Larscheid, John Olson, Ed Brown, Chris Jones, John Downing, Jeff Robichaud, Mike Burkart, and Bill Ehm.

Observers: Connie Dou (DNR), Anita Maher Lewis (Ami Consulting), Chris Gruenhagen (Iowa Farm Bureau) and Tim Johnson (Iowa Farm Bureau).

The meeting started at 10:10 AM

Joy Ramstack from the St Croix Watershed Research Center presented results of her research on the development of diatoms transfer functions and their application to paleo phosphorus concentrations. Diatoms are good indicators because the community responds rapidly to changes in lake phosphorus levels. Joy and her colleagues developed a calibration set of 89 lakes for their transfer function. These lakes span 4 ecoregions including a subdivision for the Twin Cities metro area.

We discussed with Joy the application of similar research to developing lake water-quality criteria for aquatic life uses. It was agreed that her data from Minnesota lakes will be important to defining the complete range of TP responses for the region. Iowa lake data do not reflect the lower range of TP concentrations that are found in Minnesota lakes.

Minnesota was able to distinguish shallow and deep lake classifications for the ecoregions common to much of Iowa. It was agreed that Iowa lakes would all fall into the shallow lake class except for West Okoboji.

Reservoirs were discussed and it was concluded that we will not be able to use data from them in defining a calibration set because most are too young to help define a natural or pre-European settlement condition. The general strategy discussed would be to develop a diatom-based training set relationship with TP. The results would be applied to reservoirs where appropriate.

**Aquatic Life discussions**

A strategy for developing aquatic life criteria was discussed. Several, including an EPA representative commented that aquatic life use is considered the most sensitive use for nutrient conditions.

The current aquatic life classification presents some problems: 1- it may be possible to develop criteria for lakes in the lake and wetland class, but wetlands may be much more difficult. 2- The current river classification is based on size of the stream (discharge) and limited to fish. Clarification is needed from DNR about the biological communities to be protected in lakes, wetlands, and streams before the research can be conducted and assembled to determine what direct or indirect nutrient variables could be used to protect those communities.

It was agreed that minimum thresholds for recreational use will need to serve as the most sensitive conditions until DNR gives more specific direction on aquatic life uses.

Once this direction is provided, the NSA group will be able to develop a strategy to acquire the data and knowledge needed to recommend aquatic life criteria.

## **TP Criteria Using Risk Analysis**

John Downing presented his analysis of the TP and risk of exceeding 25 ppb Chl-a and risk of transparency occurring less than 1 m Secchi depth.

The general conclusion was that a TP that allowed the indirect variables (Chl-a and Secchi depth) to be met only 50% of the time was unsatisfactory, but meeting these criteria 100% was not achievable.

There was agreement that we should consider justifying 75% rather than 85% as the frequency expected for all criteria, including TP.

**Joe Larscheid and John Downing** agreed to incorporate some additional samples taken during the summer season by UHL in the analysis with those they have been using to date.

Should we recommend that all three criteria (TP, Chl-a, and Secchi depth) be met to avoid impairment?

The discussion evolved to a tentative consensus that it was not our responsibility to answer this question. It is possible for DNR to characterize impairment as being for any one of the variables as they do for some other variables, eg dissolved oxygen.

It was a clear consensus that we need to include a recommended criteria for TP since these are nutrient criteria.

The discussion about **duration** that followed concluded with an agreement that **Summer Season** is only reasonable time unit that we can use to define duration. John Downing pointed out that the three summer samples we have been traditionally collected can be used to represent the central tendency of variables during the summer season.

**John Olson** read a draft statement for duration that was widely acclaimed. He agreed to polish it and insert it in the draft recommendation text.

TP values that were specifically discussed were 30, 65, and 100 ppb. Analysis of likelihood of specific Chl-a or Secchi depth values related to likelihood of TP values produced a nice envelope at 30 ppb. At 65 ppb TP, the relationship was not as clear with substantial variability at any risk level. 100 ppb was considered to be too large to assure sufficiently frequent compliance with Chl-a and Secchi depth.

Questions about the clarity of Figures 4 and 5 (frequency of visitor survey ranking and Secchi and Chl-a) were raised. Suggestions for alternative displays were not conclusive, so these figures will remain as plotted.

All these topics will be discussed at the next meeting.

The next meeting will be held November 5, 10:00-4:00 in Room 257, Science 1.

Discussions will center on completing the final draft of recommended criteria.

Joe Larscheid agreed to invite Steve Heiskary to the meeting to discuss the process and results of Minnesota's efforts to establish nutrient criteria for lakes.

The meeting ended at 4:10 PM.